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YOYOTA RESISTED the temptation to give its iQ a precise score, but we suspect its intelligence quotient would soar well into three figures. This new city car concept is so damned clever, it would leapfrog classroom clots

Ford and Vauxhall to breeze into Mensa's geek-infested upper reaches.

Just ask any car designer or engineer which products are hardest to build and they all agree: small cars cause big brainache. Do the maths: prices are more Poundstretcher than Prada, so budgets are tight; space is tight, too, with the need to squeeze bodies and baggage into a cramped city-friendly footprint; and minis must be cheap to run and repair. Forget fancy quad-turbo W16 hypercars – a clever urban runabout is the biggest challenge of all.

So when the world's most successful car maker focuses its considerable talents on a new tiny tot, we expect clever solutions – not just another conventional thinker built down to a price. The iQ delivers in spades. We reckon it's the most significant small car since the original Smart City Coupé back in 1997. It's that brainy.

There's been little genuinely fresh thinking in the decade since the Smart, but Toyota's new baby marks a fundamental shift. Like the Smart, it's breathtakingly small – at a city-friendly 2980mm long, it's a head longer than a Fortwo, but as tall and wide as a Yaris. It's the packaging within that diminutive frame that impresses most.

Unlike the literally titled Fortwo, the iQ can seat four – and it's likely to become the first production car to feature an innovative 3+1 format. The dashboard is cut away in front of the passenger, letting them slide the seat forward to create more legroom for an adult behind; the fourth seat behind the driver is an occasional jump seat for children or bags. It works brilliantly in practice. Although we've seen similar arrangements in the (longer) Fiat Trepino and Opel Trixx concepts, we haven't seen it in a showroom yet. This time, it's bound for the dealerships.

That sort of clever thinking permeates the Toyota iQ. How do they squeeze so much space into one so small? The engineers ignored the boot-nibbling rear-engined blueprint preferred by Smart, Mitsubishi and Volkswagen's babies; instead the engine is up front and clever detailing liberates surprising space for limbs and luggage. Toyota's engineers looked to the world of mobile phones and consumer electronics for inspiration. Miniaturisation was the way forward.

Modern cars are unwieldy constructs, with bulky air-con modules and propshafts and suspension units all getting in the way of cossetting occupants. Toyota went back to the drawing board and shrunk and moved as many components as it

could. The heating and ventilation system is dramatically smaller than on conventional cars. Result? It slots under the dashboard, making the centre console and dash thinner than normal and making room for that 3+1 layout. The fuel tank has been repositioned and flattened to be as compact as possible, too.

Toyota calls it Integrated Component Architecture, a concept that places function over styling. There isn't much switchgear, a single dial controlling all the climate functions, for instance. And there's no bulky sat-nav screen, either – it's all beamed onto a lightweight head-up display atop the dash.

Although Toyota hasn't specified what motor powers the concept, it is plotting a Yamaha 1.0-litre two-pot – so compact, the transmission can be located within the engine block. The iQ will be front-wheel drive and Toyota talks of repeating the engineering simplicity that inspired the Aygo/C1/107.

And just look at the styling. Hardly retro, is it? Designed at Toyota's European design base in the sun-kissed Mediterranean region of France, it's at once edgy and futuristic. Not to mention spookily similar to the company's FT-HS sports car concept shown at Detroit this year. The two share the same scalloped surfaces, the boldly geometric styling lines and strange triangles of the new 'vibrant clarity' design mantra – all wrapped in pearlescent white paintwork to create an identifiable new look for Toyota.

What's especially encouraging is the design's modernity. It's not dipping into the history books (like the 500 and Mini) or an attempt at a European rip-off (think the terminally dull Auris). It sets off in its own direction, brushing aside Toyota's years of same-again hotch-potch to foster a hi-tech look that's as fresh as it is technical. This nascent family style is another reason to reward the company's zesty new series of concept cars.

Of course, the acid question is: will Toyota have the balls to launch the iQ in unmolested form? The company has a patchy history of turning stunning concept cars into production reality. Just look at the middle-of-the-road Auris. But there is very little show-car pomp and ceremony about the iQ; strip away the concept-car veneer, the full-length sunroof and those 17-inch wheels, and this is one very serious small car. It's too well-finished to be a true, out-there concept car. Even the door hinges seem too properly engineered for a rushed motor show special.

That's what makes the iQ even more deserving a winner. Toyota has confirmed a new sub-Aygo car will start production in Japan from 2009, but it will be sold at a premium with prices likely to match or exceed the Aygo. The Japanese want a large chunk of the Mini profitability pie.

Go on Toyota, let your hair down. Tick the boxes and send the iQ from motor show fantasy to a showroom near us. Small cars are crying out for smarter thinking, and the iQ concept is the cleverest yet. **EQ**

In the same league



CHEVROLET VOLT GM's Bob Lutz says this is the most exciting project he's ever worked on. And with good reason. The Volt's plug-in hybrid tech looks set to best the Prius by 2011 with few pitfalls.



VW UPI Small is big right now, and VW showed its radical tiny tot at Frankfurt. The rear engine, rear-drive Upi will be sold globally from £4k. It's the car the Beetle Mk2 should have been.



OPEL GTC How to inject heart into the soulless Vectra? Show a coupé concept for next year's new repmobile. The GTC is sleek, smooth and, CAR understands, closer to reality than Ford would like.



MERCEDES F700 Diesel engines have been playing catch-up for a decade; now it's petrol's turn. The F700 uses deriv know-how for extra power and low, low emissions.

Must try harder



ACURA ADVANCED SPORTS CAR Aren't we all bored by 'the next NSX'? Honda's shown a series of teasers. The front-engined, pig-ugly ASC was just plain wrong. Back to the drawing board.